M E M O R A N D U M

DEPARTMENT OF ENVIRONMENTAL QUALITY

DIVISION OF WATER

OFFICE OF WATER RESOURCES MANAGEMENT

SUBJECT: **OWRM Guidance Memo No. 93-007**
VPA Manual Update - New PAN Uptake Tables

TO: **Regional Directors**

FROM: **Larry G. Lawson, P. E.**
Director, Office of Water Resources Management

DATE: **April 7, 1993**

COPIES: **Bob Burnley, Water Resources Managers, Dave Paylor, Martin Ferguson, Ron Gregory, and OWRM Permits Staff**

The purpose of this memo is to provide new plant available nitrogen (PAN) tables to replace the one currently found in the VPA Manual, page III-A45. The revisions were based on recommendations made by VPI's Virginia Cooperative Extension Service.

Note that the estimated yields are now presented in a separate table. A new table of legume nitrogen credits is also provided to modify downward sludge supplied nitrogen where such crops have previously been grown. This will maintain consistency on nitrogen loadings regardless of the form of Nitrogen, i.e. inorganic or organic.

The revised tables are attached. Please insert these pages into your VPA manual. They are effective immediately and should be included in all appropriate draft permits. Draft permits which are currently in the 30 day public notice period or have recently completed the public notice requirements are exempt.

If yo have any questions or comments, please contact Richard Criqui or Lily Choi.

/scj

Attachment

III F. Attachment B-1 Recommended PAN Rates

TABLE I

Recommended Plant Available Nitrogen (PAN) Rates For Various Non-irrigated Crops Used In Sludge Management Systems For Soils Receiving Infrequent (1/5 yrs) Sludge Applications

CROP	SOIL PRODUCTIVITY GROUP								
	I		II		III		IV		V
	A	B	A	B	A	B	A	B	
	Pounds of Nitrogen/Acre								
Corn Grain or Silage	160	150	140	130	120	110	100	85	65
Grain Sorghum	136	128	119	111	102	94	90		80
Soybeans Full Season Double Crop	160 128	150 113	140 119 105		120 86		100 72		65 49
Canola*	100		90		80		60		60
Wheat	100		90		80		60		60
Barley	90		80		80		60		60
Rye	75		75		75		75		75
Oats	80		80		80		60		60
Tallgrass Hay	250		250		200		160		160
Bermudagrass Hay	300		300		260		210		210
Unimproved Pasture**	120		120		100		80		80
Fescue/Orchard-grass Pasture**	120		120		100		80		80
Bermudagrass Pasture	200		200		160		120		120
Alfalfa	300		300		210		150		150
Sudangrass, Sudansorghum, millet	70		70		70		70		70
Stockpiled Tall Fescue (summer applied by 8/31)	90		90		90		60		60

* Sidedress 60 lbs fertilizer N/A in late February before spring growth begins.
** For frequent applications apply 60 lbs PAN/acre per year. Following infrequent application rate, subsequent frequent applications should be adjusted on a case by case basis, accounting for residual from other crops.

III F. Attachment B-2 Estimated Crop Yields and Legume N Credits

Table II

Estimated Yields Of Various Non-irrigated Crops For Various Soil Productivity Groups

CROP	I		II		III		IV		V
	A	B	A	B	A	B	A	B	
Corn									
Grain (bu/A)	160	150	140	130	120	110	100	85	65
Silage (T/A)	21	20	19	18	17	16	15	13	10
Grain Sorghum (bu/A)	136	128	119	111	102	94	90		80
Soybeans (bu/A)									
Full Season	50	45	40		35		25		20
Double Season	40	34	34	30	25		18		15
Canola	Not Yet		Determined -		More Data		Needed		
Wheat (bu/A)									
Standard	64		56		48		40		24
Intensive	80		70		60		50		30
Barley (bu/A)									
Standard	100		70		60		50		30
Intensive	115		88		75		63		38
Oats (bu/A)	80		80		80		60		60
Tallgrass Hay (T/A)	>4.0		3.5-4	3-3.5	<3.0		NA		NA
Bermudagrass Hay(T/A)	>6.0		4.0-6.0		<4.0		NA		NA
Alfalfa (T/A)	>6.0		4.0-6.0		<4.0		NA		NA

TABLE III

LEGUME NITROGEN CREDITS

CROP	%Stand	Yield Description	Residual N(lbs/A)
Alfalfa	50-75	Good (>4T/A)	90
	25-49	Fair (3-4T/A)	70
	<25	Poor (<3T/A)	50
Red Clover	>50	Good (>3T/A)	80
	25-49	Fair (2-3T/A)	60
	<25	Poor (<2T/A)	40
Hairy Vetch	80-100	Good	100
	50-79	Fair	75
	<50	Poor	50
Peanuts			45
Soybeans			1 lb/bu